Spatial distribution of the 2022 "biblical-scale" drought in Békés County

Experiences of some farms in relation to the severe drought

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Abstract

The purpose of my research was to illustrate the spatial distribution of the 2022 "Biblical" national drought in Békés County.

I conducted qualitative in-depth interviews with local farmers and analysed the spatial distribution of the drought with previously gathered area data and application data included in my analysis from the Hungarian agricultural Payment Agency and the so-called intermediate body, that is the Hungarian State Treasury and the Békés County Government Office that was provided by my co-author.

We found that 75 settlements in Békés County submitted 7288 reports. The data shows that settlements with larger populations also submitted more damage reports. We collected this to assist the work of the decision-makers whom are associated with rural development and rural economy research.

Both the interviews and the analysed data revealed that there were additional consequences and problems related to the great drought (continued lack of precipitation, the winters are milder even by modern standards, the rainy and dry periods became increasingly erratic and the soils capability to retain water has decreased). All interview participants are actively taking steps or have tried to implement methods and techniques that try to mitigate or reverse the harmful effects of such phenomena, with varying results. The human and economic factors persist and hamper their efforts to eliminate the existing and emerging problems; however, there have been both negative and positive changes related to these issues.

I confirmed my hypothesis: the lingering after effects of the drought can be still felt and those farmers, whom live in the area are actively working to prevent further problems and repair these lasting damages, with varying degrees of success. We also learned that the drought's impact was widespread but uneven, with certain settlements experiencing far greater agricultural losses. The spatial distribution of claims heeled patterns of precipitation deficit and heat.

Keywords: drought, spatial distribution, climate change, adaptation

JEL: P25, R59, Q18, Q14, Q54

Introduction

Nowadays, the discussions related to the reality of global climate change is brought up regularly even on global forums. It is a regularly renewed topic with increasingly convincing arguments that it is a process that humanity must take seriously. A series of scientific researches are proving that the planet's climate is becoming more extreme, that the Earth is warming, and that the water and atmosphere are changing rapidly. The World Meteorological Organisation in its latest report related to the global changes in climate reported, that he annually averaged global mean near-surface temperature in 2024 was 1.55 °C ± 0.13 °C, a number that is both above the 1850–1900 average and marks 2024 as the warmest year in the 175-year observational record, beating the previous record set only the year before (WMO, 2025).

The issues related to it surfaced almost two decades prior. Even from an economic point of view, the Stern Review (Stern N., 2007) already considered climate change as a factor of significant risk in the world economy, and estimates that the damage caused by climate change could reach 20% of global gross domestic product. I'd also like to bring up the "Sixth Assessment Report, Climate Change 2021: The Physical Science Basis", a series of assessment reports created by the International Panel on Climate Change, that issued a Red Alert in 2021, and kept up that warning since then. Greenhouse gas emissions must peak; they should have peaked by 2025. It warned us that climate change is widespread, rapid, and intensifying, and some trends are now irreversible. It has also set 2030 as the climate change deadline for gas emissions to be halved and reach net zero by 2050. Jim Skea from the Imperial College London and co-chair IPCC working group said, that "It's now or never, if we want to limit global warming between 1.5°C to 2°C" (WMO, 2022).

Even the latest Conference of Parties (COP29), the "2024 United Nations Climate Change Conference" set more than one milestone in promoting climate action in different areas, including putting in the spotlight topics that had received less attention at previous sessions, such as climate change in relation to small and medium enterprises, informality and tourism. It launched numerous new initiatives, pledges -such as the Global Energy Storage and Grids Pledge; endorsers commit to a collective goal of deploying 1,500 GW of energy storage globally by 2030—over six times the capacity of 2022. It also includes a commitment to add or refurbish 25 million kilometres of grids globally by 2030, recognising the need to add or refurbish an additional 65 million kilometres by 2040 ()- amongst other initiatives, reports, funding opportunities and other activities were launched, with the goal to advance climate action in line with the Paris Agreement goals and the outcomes of the first global stock take (UNFCCC, 2024).

My current research aims to re-examine the findings of my prior surveys, which I conducted after the great drought of 2022 devastated the local area (Vigh-Rákóczi, 2022, 2023), along with examining the effects of drought spatially. I believe these data points would be of use in assisting the work of the decision-makers who are associated with rural development and rural economy research. In view of these data points, our article set the following goals:

- Which aspects of climate change directly and indirectly affected the farms since 2022
- If any changes occurred, are there additional issues, are the old issues gone or have they exacerbated?
- Which are the most exposed agricultural sectors, what technological changes and modernization activities do farmers use to ease and eliminate the existing problems?
- Is the Common Agricultural Policy a caring agricultural policy? Did it assist the farmers after the catastrophe?
- How did the agricultural compensation system react? What were the farmers' opinions related to its actions?

What was the spatial distribution of the 2022 drought at the county level (with a national outlook) The great drought of 2022

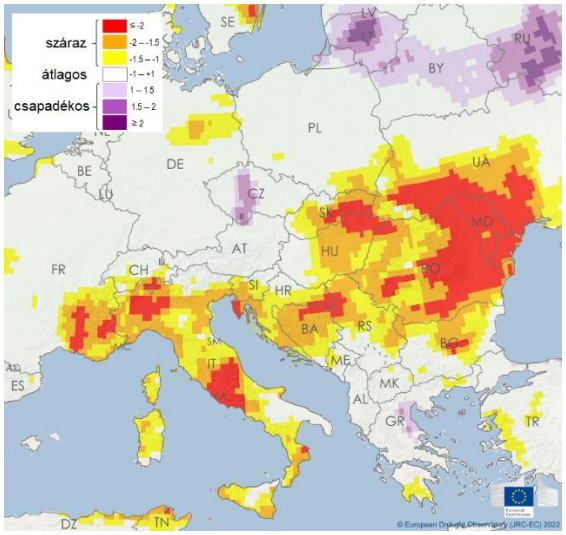

Figure 1. Drought areas in Central and Southern Europe in June 2022 collected by the European Drought Observatory

Source: HungaroMet, 2022

Although droughts of similar severity occur in Hungary every 20-50 years (the 1863 drought on the Great Plain was unprecedented, and 1952 was the driest year of the 20th century), the 2022 drought was also very severe (Szamosvári, 2022; Erdődiné–Kovács, 2023), although not as severe as certain other areas of Cental and Southern Europe (Figure 1.). We can consider the 2022 drought the most serious event of the 21st century so far. The amount of precipitation fell short of the multi-year average in 2020 and 2021, while we experienced long heat waves in the summer. The total rainfall of the agricultural year was extremely low, with only 275 mm falling in Szeged (50% of the long-term average) and barely exceeding 300 mm elsewhere. According to initial estimates, the drought affected 1 million hectares, with a crop loss of approximately 50% related to sunflowers. The "coexistence" of three factors: meteorological, hydrological and atmospheric drought, led to the development of the extraordinary drought. The development of the hydrological drought suggests that the lack of precipitation occurred over a larger area, in the catchment area of our

rivers, so a global meteorological phenomenon covering a larger part of Europe causes the development of the most severe "super" droughts (Rákóczi, 2022a).

The HungaroMet Hungarian Meteorological Service Nonprofit Co., Ltd. summarized the following regarding the phenomenon (HungaroMet, 2022):

"Unfortunately, the weather of 2022 was famous for its historic drought, because of which the yields of both autumn and summer crops were below the averages of previous years, but animal husbandry also suffered from the drought. In the first three months of the year, there was hardly any precipitation in a significant part of the country, then in April there was some relief, at which time the lack of heat hindered the development of the plants, but frosts that destroyed the fruit crop were not typical. From May to mid-August, almost only showers fell, which is characterized by very high regional variability. The rainy Medárd period was completely absent, although rain still irrigated the western and southwestern parts of the country in June; however, in July, the severe drought affecting the Great Plain since the beginning of summer spread to Transdanubia, peaking in mid-August. Several heat waves compounded the drought during the summer. Abundant precipitation arrived in the last decade of August and in September, creating favorable conditions for autumn sowing, although the early development of wheat crops became difficult during the also extremely dry October. However, because of the rains in November and the milder than average weather, both rapeseed and autumn cereals could face the winter well developed and strengthened."

Common Agricultural Policy and the Agricultural Damage Mitigation System

As per the summary of the European Commission, launched in 1962, the EU's Common Agricultural Policy (CAP) is a partnership between agriculture and society, and between Europe and its farmers. It aims to: support farmers and improve agricultural productivity to ensure a stable supply of affordable food. Seeks to safeguard European Union farmers to make a reasonable living and help them tackle climate change and the sustainable management of natural resources. It assists with the maintenance of rural areas and landscapes across the EU. To keep the rural economy alive CAP also promotes jobs in farming, agri-food industries and associated sectors. The CAP is a common policy for all EU countries. It is managed and funded at European level from the resources of the EU's budget (European Comission).

Later, Agenda 2000 reforms reshaped the support system into a two-pillar system. The 1st pillar is market policy, the financial source of which is the so-called European Agricultural Guarantee Fund (EAGF). The 2nd pillar is rural development, the financial source of which is the so-called European Agricultural Fund for Rural Development (EAFRD) (Rákóczi–Barczi, 2015). Besides all this, the so-called national subsidies, which the government provides to eligible farmers, constitute a significant source in Hungary (Rákóczi, 2022b)

The Treaty on the Functioning of the European Union sets the legal basis for the common agricultural policy. Three regulations which apply since 1 January 2023 cover the current CAP 2023-27 (European Comission).

A two-pillar risk management system has been in place in Hungary since 2012, and since its introduction it has been under continuous development, and the range of risks covered is also expanding. Since the beginning, the aim has been to further develop the agricultural risk management toolbox and expand it with risk prevention tools. An example of this is the introduction of the third pillar, the national hail damage prevention system, in May 2018. The amount of the compensation may not exceed 80% of the loss of production value if the producer has adequate agricultural insurance.

The first pillar of this system, which is related to our research, is the Agricultural Damage Mitigation System, which has expanded as an agricultural damage mitigation system compared to the previous regulations that were in place, it provides state aid against damage caused by adverse weather phenomena (drought, inland water, agricultural flooding, winter frost, spring frost, autumn frost, cloudburst, storm, hail), approved by the European Commission. According to EU regulations, this aid compensates for the losses of yield reductions exceeding 30% at the crop level for producers who are members of the system (Government, 2025).

Spatial examination of the effects of the drought during and after 2022

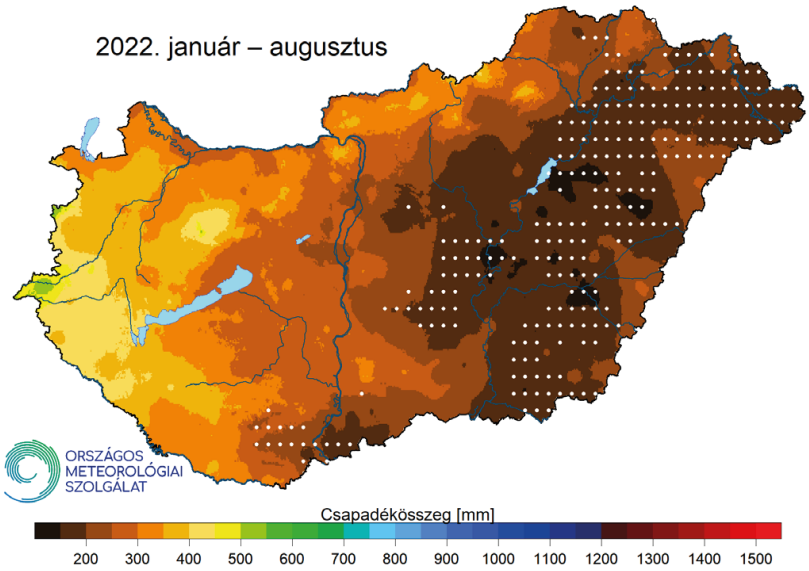

Figure 2. Precipitation totals in Hungary in the period January–August 2022 (white dots show record-dry areas).
Source: Szentes, 2023

The quarterly Newsletter of the Hungarian Meteorological Service and the Hungarian Meteorological Society, LÉGKÖR took note of the extremes inflicted by the great drought of 2022.

My study primarily focused on how the eastern part of Hungary, mainly the Great Plain, was affected the most by this phenomenon. The worst situation developed in the summer, which, besides the poor precipitation weather, became the warmest national average since the beginning of the 20th century, almost half a degree ahead of the previous record-breaking summer of 2003. East of the Danube, the eight-month precipitation did not reach 250 mm by the end of August (Figure 2.), while in the central Great Plain and Trans-Tisza region, it remained below 200 mm in a large area and 150 mm in smaller areas. Primarily in these regions, the January–August period of 2022 became the first eight months of the driest year since 1901. Drought also characterized 2021, contributing significantly to the development of the severe drought experienced in 2022. Observing the data gathered about the deviations of 2021 and comparing them to the monthly average temperatures and precipitation values of the last few decades (1991–2020) in the period of January 2021 – August 2022 (Figure 3.), we can see that the persistently dry period began in June of the year, but even March precipitation was significantly below average.

Most of the months, besides being dry, were several degrees warmer than the 1991–2020 climate normal. There were only two months in the twenty-month period examined that were several degrees cooler and also rainy, May 2021 and April 2022. In the year leading up to August 2022, the national average of precipitation for seven months was over 40% below normal, and the drought was further exacerbated because every month since May 2022 was significantly warmer than average, and the summer of 2022 was the warmest national average since 1901. In the period from January 2021 to August 2022, the national average precipitation was only about three-quarters of the usual amount (Szentes,2023; Erdődiné and associates, 2023).

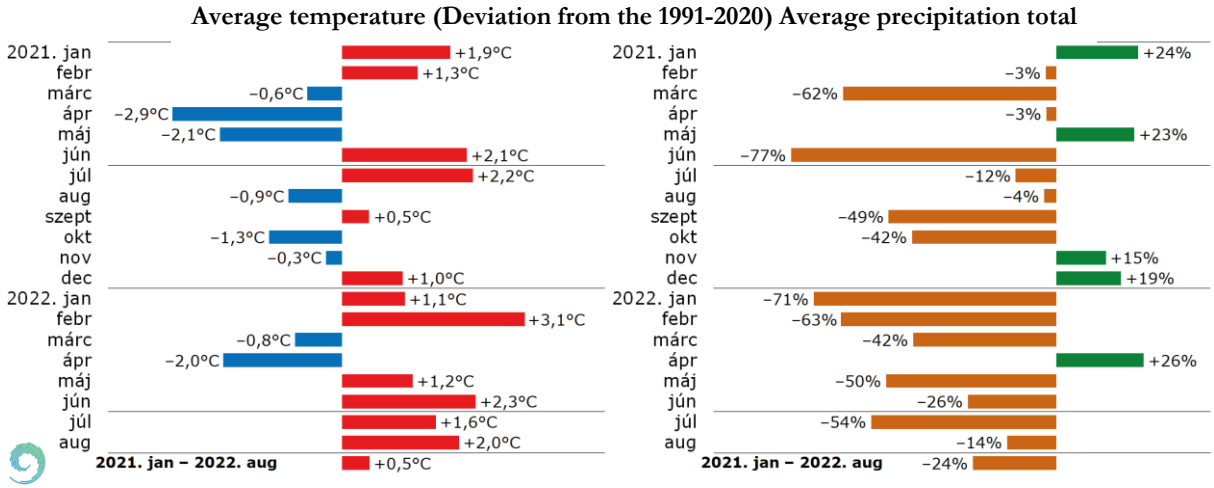

Figure 3. Deviation of national averages of monthly mean temperature (left) and precipitation (right) from the 1991–2020 average for the period January 2021 – August 2022.

Source: Szentes, 2023

Besides the field of meteorology, the most noticeable changes happened in the agricultural sector. The average yield of major arable crops took a noticeable dip in all categories.

Table 1. Average yield of important arable crops in Hungary [kg/hectare] (KSH)

Year	Wheat	Corn	Barley	Rye	Oats	Soybeans	Sunflower seeds
2020	5 470	8 580	5 680	3 200	2 990	2 830	2 770
2021	5 930	6 130	6 370	3 310	3 060	2 520	2 680
2022	4 450	3 410	4 810	2 940	2 270	2 030	1 890
2023	5 640	8 150	5 380	3 200	2 750	2 980	2 920
2024	5 710	6 030	5 450	3 130	3 020	2 310	2 670

Source: KSH, 2025

As seen in Table 1. corn yields show the largest fluctuations, dropping sharply around the time of the great drought, but show recovery in 2023. Wheat and barley yields remain relatively stable throughout the years, with only a noticeable dip in 2022. Meanwhile Soybeans and sunflower seeds follow a similar pattern, with lower yields in 2022 and partial recovery afterward. Rye and oats yields are also stable, but likewise also show a drop in 2022.

In connection with this, the size of the various sowing areas also changed after the drought, although this will change from 2023: here the so-called Green Deal has gained ground, and the increasingly strict regulations of the new budget period have also determined the sowing structures in the county. Consequently, we observe several differences for each crop compared to the prior year's data, which shows how farmers are reacting to the new regulations, while we can only analyze the effects of the new period's regulations from a longer perspective in the future.

Damage mitigation and consequences

According to the findings of (Rákóczi, 2022b), in Békés County the number of damage mitigation applications, reported within its territory has continuously increased year by year. While the related authorities received 200 applications in 2018, in 2022 they received nearly 7,300. There may be several reasons for the increase, including the development and expansion of the damage mitigation benefit institution, and its increasing accessibility to farmers. Changes in weather factors are mostly responsible for the clear increase, besides the other factors. Year by year, farmers mostly submit their claims for drought damage, inland water damage, and hail damage. It should be noted, however, that drought damage is special amongst these claims, as the number of applications related to this issue has been constantly increasing year-by-year. The historic 2022 drought clearly caused the significant increase in applications, because this damage type alone received more complaints (7179) in 2022, then the total complaints for all damage types (4684) between 2018 and 2021.

The additional workload was significant (4 times more than usual), in order to fully complete the tasks associated with the handling of claims for damages, the Agricultural Department of the Békés County Government Office redirected the specialist administrative colleagues from other (mostly agricultural) fields, to ensure that the farmers received the official verdicts related to their report regarding damages and, overall what is the state of their access to damage mitigation benefits (Rákóczi, 2022b).

Material and Methods

I primarily collected data for my research work in Békés County. The county is located in the Southern Great Plain region, with its seat in Békéscsaba. It has an area of 5631.05 km^2 and has 9 districts (Békéscsaba, Békés, Szeghalm, Gyomaendrőd, Szarvas, Orosháza, Mezőkovácsháza, Gyula, Sarkad) in which there are 75 settlements (1 city with county status and 21 other cities). According to the Central Statistical Office (KSH) surveys, in 2022 approximately 315,222 people lived in Békés County with an average population density of 66.8 people/km^2 (KSH, 2014; KSH, 2023).

Békés County is located in the Great Plain, its area is flat. The Körös-Maros River and the Körösök-Berettyó region are almost perfectly flat. The altitude of the county varies between 81 and 106 metres above sea level. The highest points are in the southeastern part of the county, on the Csanádi-hát, and in the Battonya area, some kunhals, which exceed 106 metres in height. The lowest point is between Szarvas and Békésszentandrás, next to the Hármas-Körös, at an altitude

of approx. 81 metres. The county is covered by a thick layer of sandy-loess sediment. The county's most significant mineral resource is natural gas, with approx. one-fifth of the country's reserves found here. The continuity of the plains is divided by a relatively dense network of rivers. The county has 8 rivers: the Körös (Fehér, Fekete-, Kettős-, Sebes- and Hármas-Körös), Berettyó, Száraz-ér, Hortobágy-Berettyó (KSH, 2014).

To further analyse the local region, I also reviewed data of agricultural landscape of Békés county. Due to its up-to-datedness, it is advisable to illustrate land use data and crop structure data with the data in the agricultural support system. Therefore, with the assistance of my co-writer I requested the area data and application data included in my analysis from the Hungarian agricultural Payment Agency and the so-called intermediate body, i.e. the Hungarian State Treasury and the Békés County Government Office. To visualise these data points I created Figure 4. and Figure 5. During the creation process first I compiled the necessary data (regional map, settlement names and location, number of parcels) then utilised the capabilities of Microsoft Excel.

To collect my data, I talked to the local farmers whom I worked with previously related to past research subjects and began to inquire about their willingness to provide further information related to this subject. On a few occasions I was met with failure due to personal issues, in those cases I followed their recommendations or contacted other farmers I was in contact with.

As part of my research, I conducted five qualitative in-depth interviews during the months of December, January and Februrary of 2024 and 2025 respectively. The interviews were also audio-recorded using a dictaphone for later processing. They range in length from 30 to 60 minutes. A literal transcript of the interviews was not made.

It should be also noted, that introductory questions were not necessary, as past familiarity persisted with the interview subjects.

I based the interviews on the methodology Heltai és Tarjáni (1999). The completed interviews were subjected to quantitative evaluation and content analysis based on the methodological suggestions of Babbie (2003) and Newing (2011). The data of the interviews with the farmers concerned are illustrated in the table below:

Table 2. Further details about the farmers

Surename	Age	Profession
Zsombor	27	Family maintaned Limited company.
Lénárt	45	Primary producer/Site manager
György	53	Primary producer/ Primary Family Farm
Pál	72	Primary producer/ Primary Family Farm
Mihály	82	Primary producer

Source: Own data, 2025

Throughout the interviews, it was important for me, that the farmers convey their own opinions. During our sessions, I did not ask technical terms as to not negatively influence their views. I allowed them to talk freely about their farming and their difficulties without outside pollution from my part. When they themselves brought up information related to the topic, I directed the conversation toward it to gather as much data as possible about the mentioned fact.

Results

Table 3. Plots reported for damage mitigation in 2022, broken down by settlement

Settlements	Number of parcels
Almáskamarás	101
Battonya	591
Békés	662
Békéscsaba	896
Békéssámson	714
Békésszentandrás	635
Bélmegyer	158
Biharugra	176
Bucsa	136
Csabacsűd	308
Csabaszabadi	195
Csanádapáca	437
Csárdaszállás	121
Csorvás	1316
Dévaványa	805
Doboz	220
Dombegyház	335
Dombiratos	163
Ecsegfalva	252
Elek	371
Füzesgyarmat	626
Gádoros	496
Gerendás	325
Geszt	96
Gyomaendrőd	1926
Gyula	1341
Hunya	512
Kamut	226
Kardos	336
Kardoskút	624
Kaszaper	383
Kertészsziget	124
Kétegyháza	301
Kétsoprony	718
Kevermes	353
Kisdombegyház	87
Kondoros	772
Körösladány	821
Körösnagyharsány	140
Köröstarcsa	170
Körösújfalu	137
Kötegyán	114
Kunágota	561
Lőkösháza	358
Magyarbánhegyes	401
Magyardombegyház	78
Medgyesbodzás	208
Medgyesegyháza	563
Méhkerék	104
Mezőberény	620
Mezőgyán	199
Mezőhegyes	366
Mezőkovácsháza	873
Murony	234
Nagybánhegyes	613
Nagykamarás	346
Nagyszénás	707
Okány	445
Orosháza	1684
Örménykút	277
Pusztaföldvár	528
Pusztaottlaka	136
Sarkad	492
Sarkadkersztúr	93
Szabadkígyós	149
Szarvas	654
Szeghalom	650
Tarhos	249
Telekgerendás	460
Tótkomlós	1084
Újkígyós	505
Újszalonta	71
Végegyháza	263
Vésztő	600
Zsadány	945
Total number of parcels	**34 136**

Source: (BÉVKH 2022)

A total of 7288 reports were received from 75 settlements (all settlements in the county) for 34136 plots and 205684 hectares.

To assist in the visualisation of data listed in Table 3. I created a map overview of Békés County, highlighting the settlements with blue dots; the size of the dots corresponds to the number of request parcels registered in their general area and a bar chart that showcases the number of parcels per settlement

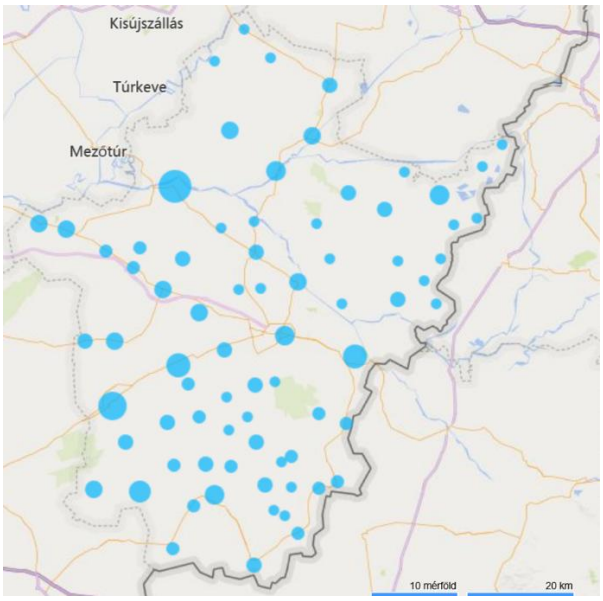

Figure 4. Békés County with the visualisation of Table 3. data

Source: Own editing, 2025

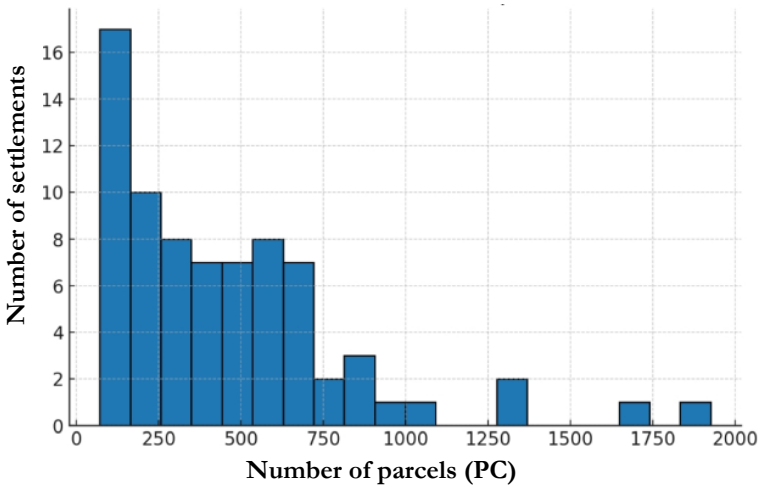

Figure 5. Bar chart that showcases the number of parcels per settlement in Békés County utilising the data of Table 3.

Source: Own editing, 2025

The following statistical information can be gathered from these data points:

- **Number of settlements**: 75
- **Mean**: ~463 parcels
- **Median**: 366 parcels
- **Standard deviation**: ~365 parcels
- **Minimum**: 71 parcels
- **Maximum:** 1926 parcels
- **Lower quartile (25%):** 186 parcels
- **Upper quartile (75%):** 625 parcels

Observing Table 3. and Figure 4. and Figure 5. alongside this information, we can see that most settlements have a small to moderate number of parcels. The median (366) and lower quartile (186) show that half of the settlements have fewer than 366 parcels, and a quarter have fewer than 186. The mean (463) is higher than the median, which suggests some settlements have much larger parcel numbers that increase the average. This points to a right-skewed distribution. The standard deviation (365) is quite large, almost as big as the mean. This shows the number of parcels varies a lot between settlements. The minimum and maximum values (71 and 1926) show a wide range. Some settlements are much bigger than others. The upper quartile (625) means the largest 25% of settlements have 625 parcels or more. The descriptive statistics of parcel distribution across the 75 settlements reveal a noticeable wide variation. It highlights a considerable standard deviation across Békés County because the parcel distribution is highly uneven across settlements, with most settlements having fewer parcels, but a few settlements with very large numbers of parcels pulling up the average.

We can also highlight the following spatial differences in the region:

- **The mean (463) is higher than the median (366).** This suggests that a few settlements have very high parcel numbers (outliers) and it also means that the distribution is right-skewed.
- **The standard deviation (365) is large (range is 71 to 1926)**, almost as high as the mean, which highlights once more that some settlements are much larger than others
- **Half of settlements have fewer than 366 parcels (Lower Quartile 186, Median 366, Upper Quartile 625)**

While not fully perceptible in the text format, the farmers were eager to share their experiences, what happened to their farms since our last meeting during the interviews (body language, emphasis). It was noticeable, that throughout the years the extent of their experience and the depth of their knowledge increased, they actually know the lands they cultivate upon, their farms are important to them. It was noticeable in the interviews, that the most outstanding problems in their everyday life were related to the effects of the climate change, or the after effects of the catastrophe that was the great drought of 2022, the biggest problems that reared their head related to the phenomenon are continued lack of precipitation, that the winters are milder even by modern standards, the rainy and dry periods became increasingly erratic and the soils capability to retain water has decreased drastically. Other issues and minor problems include the increased frequency of inland water and the dramatic shifts in temperatures, which are also causing damage to their livelihoods.

"I feel that cultivation needs to be curtailed, we must leave the soil time to rest, and the fertilizer output needs to be lowered, because the costs are getting to point where the amount we invest and the amount earn do not cover each other, most of the time farmers here are in the red. /Mihály, 82/"

"You cannot sow corn, sorghum, or maize, the weather avoids us in such a way that these crops are no longer profitable for sowing or harvesting. The type of plants grown have changed? Even my old sunflowers that were cultivated for a long time, for example, have now gone to zero, they do not return the investment. /György, 53/"

"Irrigation is difficult. There is no equipment for it, the canals are destitute or non-existent. So, here we praying for good weather. /Pál, 72/"

"Looking back on 2022, it was a horrid year, even from a three-year perspective, it was a very tough year. It left a deep mark both economically, and on nature. What could have been done differently in 2022, I really don't know, because I'm sure no one could have saved the unsalvageable, even with our current knowledge. The soil's water reserves are not what they were before. 2022 took an awful lot out, sucked it out of the soil. There hasn't been a normal amount of precipitation since then, so we're trying to preserve and appreciate the little that we have even better with these reduced numbers and quality. /Lénárt, 45/"

Besides the problems caused by the environmental factors, problems related to the economy also further exacerbate other issues. The cost of maintaining equipment already in use suffering from damages caused by amortization factors, modernising and implementing new equipment to adapt to the new issues that appear all cost considerable amount of funds, that the small farms might not be able to afford.

"There are those, that actually started to keep their operations to a minimum, because you can't actually do the necessary groundwork anymore, like ploughing, loosening the soil and things like that, because the amount invested no longer matches the amount earned, you won't get it back. /György, 53/"

"The costs don't match. If you can't store, you can't get proper profits, because you have to sell them in bulk at the current, not always good price, and there's nowhere to store your harvest. Well there are places, but those storage costs are not the same as others. Only the big ones, actually have the funds to sell their stock after storing it there for half a year for a better opportunity, and when the market is favourable to them. The small ones don't have that opportunity. /Mihály 82/"

"It doesn't work anymore like it used to. To be profitable by calculating those old crop averages we used to. Using hired labour, doing what needs to be done... The math no longer works out, and that's why some are stopping. As they put it, it's a kind of self-perpetuating circle, one thing leads to another that keeps going on and on ever worse. /Pál, 72/"

However in spite of that it should be noted that four out of five subjects took conscious action to counteract the processes of climate change and one tried but did not have a real opportunity to do so, inhibited by external human or natural factors (land position in the county, lack of material background), but at least in such cases he at least tried to implement them, they considered their available options. Furthermore, it is important that for the most part, irrigation, the modernization of farms and the cooperation of farmers working in the surrounding areas were seen as a solution to the problems, amongst other possibilities.

"We need local demand. Tor restore the systems of the past, when there were all kinds of buyers for our products, to purchase and sell locally. Places in small settlements where small time farmers can handle acquisitions without the necessity to sell in bulk and hope for the best. Places where we can sell dairy, eggs, crops with fair prices. /Mihály 82/"

"People need to stand on more than one leg, must have additional sources of income, nest eggs for harsher times. Be it passive or in some other form, that way when a catastrophe ruins one pillar the others prevent things from falling apart. /Pál 72/"

"We must use crops that handle the changing climate better, they don't wither away at these drastic shifts. /Zsombor, 27/"

"We must learn. We must talk with each other and listen. I'm consulted by both small and large farms (including some as extensive as 200 hectares) on my farming practices, because my experimentation with different techniques has sometimes yielded positive results. How I could install it? What are the experiences? So, there is such a path ahead, and not only for the large ones to reach out amongst each other but to the small or medium-sized farms, all sides and paths must provide information, everyone must look for a way. /Lénárt, 45/"

Although I cannot highlight the same amount of exact quotes on the topic, based on the interviewees' request, as the topic came up mostly when they discussed personal finances, however I can note, that the farmers expressed extremely positive attitudes toward various forms of government assistance and the Common Agricultural Policy, appreciating the help they received during and after the great drought of 2022.

"As I said before, things don't work as they did once, these new initiatives are different then it was before. Some of those funds they gave to some, have been important for some folks to keep themselves afloat I don't know much about it myself, but I heard it motivated some to remain and keep things going. /Mihály 82/"

Discussion and conclusion

The purpose of my research was to re-examine my local area, related to the catastrophic great drought of 2022, which afflicted vast swathes of Hungary, to assist the work of the decision-makers whom are associated with rural development and rural economy research.

Reviewing our findings, interview results and the literature associated with the topic we can extrapolate, that the the 2022 drought affected every settlement in Békés County, Hungary. A total of 7,288 reports for damage mitigation were submitted from 75 settlements, covering 34,136 plots and 205,684 hectares. The highest numbers of affected plots were reported in Gyomaendrőd (1,926), Orosháza (1,684), Gyula (1,341), and Békéscsaba (896). The drought's impact was widespread, with both small and large settlements reporting significant damage. This pattern reflects a county-wide crisis and highlights a vulnerability to similarly extreme weather events.

It can be seen, that even years after the great drought phenomena happened, some of its effects still linger in the local area. Direct lingering effects include: persistent lack of precipitation, milder winters, erratic rainy and dry periods and reduced soil water retention. Indirect effects include increased frequency of inland water, dramatic temperature swings and higher costs for adaptation and maintenance. These remaining problems are noticeable in the area and they are the cause of major detriments for the local farmers. . New problems have also emerged, like the inability to grow previously reliable crops and the rising costs of inputs. Economic pressures, such as storage costs and market volatility, have compounded these challenges. Many small farmers now struggle to break even, and some have reduced operations or left farming altogether.

As a positive result Interviewees expressed appreciation for the CAP and government assistance. They described the policy as supportive, especially during and after the 2022 drought. CAP funds helped some farmers stay afloat and motivated others to continue farming. The policy is seen as important for both production and rural development, though not all farmers benefited equally. The compensation system responded by processing thousands of damage reports. Farmers generally viewed the system positively, especially those who received support. However, some noted that the assistance was not enough to fully offset their losses, particularly for small-scale farmers with limited resources.

At the county level, every settlement in Békés reported damage, with the most severe impacts in areas with large numbers of agricultural plots. The spatial distribution shows that the drought was not isolated but affected the entire county. Nationally, this pattern reflects a broader trend of increasing vulnerability to climate extremes across Hungary. It seems farmers are adapting through diversification, cooperation, and modernization where possible.

For this farmers have a multitude of options to address the challenges posed by the changing climate. Their avenues of adaptation include the diversification of the crop rotation (adding 1 or more suitable cash crops to the rotation), cover cropping (cover soil year-round with a single or multiple species of cover crops), intercropping (intercrop row crops with suitable legume), conservation tillage (reduce tillage intensity to "mulch till"), water retention (practice mulching across the land or incorporate drought resistant crop species into rotation), livestock integration (graze and rotate external livestock on the land for a portion of the season or integrate formal rotational grazing system year-round), the lessened use of pesticide, undersowing (undersow row crops with a suitable crop or grass), hedgerows (restore roughly 10% of cropland to natural prairie with integrated shrubs) or the integration biofertilizers.

Acknowledgments

I'd like to thank the Hungarian University of Agriculture and Life Sciences (MATE) Institute of Rural Development and Sustainable Economy and the Sustainability and Resilience International Scientific Conference (SRISC) for the opportunity to create this paper.

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